

July 21, 2003

Mr. Dennis Sharp
United States Penitentiary
4200 Bureau Road North
Terre Haute, Indiana 47808

Re: 167-16927
Significant Permit Modification to
Part 70 No.: T 167-6106-00019

Dear Mr.Sharp:

United States Penitentiary was issued a Part 70 operating permit on July 19, 2001 for a maximum security prison. An application to modify the source was received on June 6, 2002. Pursuant to the provisions of 326 IAC 2-7-12 a significant permit modification to this permit is hereby approved as described in the attached Technical Support Document.

- (a) Four (4) natural gas fired boilers, using No. 2 fuel oil for backup, identified as: B-UP-1 with a maximum heat input rate of 42 million (MM) Btu per hour, B-UP-2 with a maximum heat input rate of 42 million (MM) Btu per hour, B-UP-3 with a maximum heat input rate of 42 million (MM) Btu per hour, and B-UP-4 with a maximum heat input rate of 42 million (MM) Btu per hour. Emissions exhausting to the following stacks: 11, 12, 13, and 14, respectively.
- (b) Four (4) No. 2 fuel fired emergency generators, identified as: EG-1 with a maximum heat input rate of 11.55 million (MM) Btu per hour, EG-2 with a maximum heat input rate of 11.55 million (MM) Btu per hour, EG-3 with a maximum heat input rate of 11.55 million (MM) Btu per hour, and EG-4 with a maximum heat input rate of 11.55 million (MM) Btu per hour. Emissions exhausting to the following stacks: 15, 16, 17, and 18, respectively.

All other conditions of the permit shall remain unchanged and in effect. Please attach a copy of this modification and the following revised permit pages to the front of the original permit.

This decision is subject to the Indiana Administrative Orders and Procedures Act - IC 4-21.5-3-5. If you have any questions on this matter, please contact Mr. Darren Woodward, VCAPC, 103 South Third Street, Terre Haute, Indiana 47807, or call at (812) 462-3433, extension 15.

Sincerely,

Original Signed by George M. Needham
George M. Needham
Director
Vigo County Air Pollution control

Attachments

DKW

cc: Mindy Hahn - IDEM
Winter Bottum - IDEM

SECTION D.4

FACILITY OPERATION CONDITIONS

Facility Description [326 IAC 2-7-5(15)]

- (a) Four (4) natural gas fired boilers, using No. 2 fuel oil for backup, identified as B-UP-1, B-UP-2, B-UP-3, and B-UP-4, with a maximum heat input rate of 42 million (MM) Btu per hour heat input each, and emissions exhausting to the following stacks: 11, 12, 13, and 14, respectively.
- (b) Four (4) No. 2 fuel fired emergency generators, identified as: EG-1, EG-2, EG-3, and EG-4, with a maximum heat input rate of 11.55 million (MM) Btu per hour each, and emissions exhausting to the following stacks: 15, 16, 17, and 18, respectively.

Emission Limitations and Standards [326 IAC 2-7-5(1)]

D.4.1 Particulate Limitations [326 IAC 6-1-2]

Pursuant to 326 IAC 6-1-2(a), general particulate matter emitting units shall not discharge to the atmosphere gases which contain in excess of 0.03 grain per dry standard cubic foot of particulate matter.

Pursuant to 326 IAC 6-1-2(b)(2), particulate matter emissions shall not exceed 0.15 pounds per million BTU for all liquid fuel fired steam generators.

D.4.2 Particulate emission limitations for sources of indirect heating [326 IAC 6-2-4]

Pursuant to 326 IAC 6-2-4 (Particulate emission limitations for sources of indirect heating) the particulate emissions from indirect heating facilities constructed after September 21, 1983 (Boilers #1, #2, #3, #5, #6, B-UP-1, B-UP-2, B-UP-3, and B-UP-4) shall be limited to 0.236 pounds per million (MM) Btu heat input.

This limitation is based on the following equation: $Pt = 1.09/Q^{0.26}$, where Pt = pounds of particulate matter emitted per million Btu (lb/MMBtu) heat input. Q = total source maximum operating capacity rating in million Btu per hour (MMBtu/hr) heat input.

D.4.3 Sulfur Dioxide (SO₂) [326 IAC 7-1.1-1]

Pursuant to 326 IAC 7-1.1 (SO₂ Emissions Limitations) the SO₂ emissions from the four (4) boilers, using No. 2 fuel oil as backup, (total of 168 MMBtu per hour) and the four (4) oil-fueled emergency generators (total of 46.2 MMBtu per hour) shall not exceed five tenths (0.5) pounds per MMBtu heat input each.

D.4.4 Preventive Maintenance Plan [326 IAC 2-7-5(13)]

A Preventive Maintenance Plan, in accordance with Section B - Preventive Maintenance Plan, of this permit, is required for this facility and its control device.

D.4.5 PSD Minor Limit [326 IAC 2-2]

- (a) The fuel oil usage for the four (4) Hurst Boilers and the four (4) Caterpillar Emergency Generators combined shall not exceed 927 thousand gallons (kgal) per twelve (12) consecutive month period based on a maximum allowable sulfur content of 0.5% and a heat content of 140,000 Btu per gallon of no. 2 fuel oil. This limitation is equivalent to a potential to emit of less than 40 tons of SO₂ per year. Compliance with this limit makes 326 IAC 2-2 and 40 CFR 52.21 (Prevention of Significant Deterioration) not applicable.
- (b) The natural gas usage for the four (4) Hurst Boilers shall not exceed 747 million (MM)

cubic feet per twelve (12) consecutive month period. This limitation is equivalent to a potential to emit of less than 40 tons of NO_x per year. Compliance with this limit makes 326 IAC 2-2 and 40 CFR 52.21 (Prevention of Significant Deterioration) not applicable.

Compliance Determination Requirements

D.4.6 Testing Requirements [326 IAC 2-7-6(1),(6)]

The Permittee is not required to test this facility by this permit. However, IDEM and VCAPC may require compliance testing at any specific time when necessary to determine if the facility is in compliance. If testing is required by IDEM and VCAPC, compliance with the Particulate Matter and Sulfur Dioxide limits specified in Conditions D.4.1, D.4.2, and D.4.3 shall be determined by a performance test conducted in accordance with Section C - Performance Testing.

D.4.7 Sulfur Dioxide Emissions and Sulfur Content

Compliance shall be determined utilizing one of the following options.

- (a) Pursuant to 326 IAC 3-7-4, the Permittee shall demonstrate that the fuel oil sulfur content does not exceed five-tenths percent (0.5%) by weight by:
 - (1) Providing vendor analysis of fuel delivered, if accompanied by a certification;
 - (2) Analyzing the oil sample to determine the sulfur content of the oil via the procedures in 40 CFR 60, Appendix A, Method 19.
 - (A) Oil samples may be collected from the fuel tank immediately after the fuel tank is filled and before any oil is combusted; and
 - (B) If a partially empty fuel tank is refilled, a new sample and analysis would be required upon filling; or
- (b) Compliance may also be determined by conducting a stack test for sulfur dioxide emissions from the three (62.5) MMBtu per hour boilers, using 40 CFR 60, Appendix A, Method 6 in accordance with the procedures in 326 IAC 3-6.

A determination of noncompliance pursuant to either of the methods specified in (a) or (b) above shall not be refuted by evidence of compliance pursuant to the other method.

Compliance Monitoring Requirements [326 IAC 2-7-6(1)] [326 IAC 2-7-5(1)]

D.4.8 Visible Emissions Notations

- (a) Daily visible emission notations of the four (4) boiler stack exhausts (11, 12, 13, and 14) and the four (4) emergency generator stack exhausts (15, 16, 17, and 18), shall be performed during normal daylight operations when using fuel oil and exhausting to the atmosphere. A trained employee shall record whether emissions are normal or abnormal.
- (b) For processes operated continuously, "normal" means those conditions prevailing, or expected to prevail, eighty percent (80%) of the time the process is in operation, not counting startup or shut down time.
- (c) In the case of batch or discontinuous operations, readings shall be taken during that part of the operation that would normally be expected to cause the greatest emissions.
- (d) A trained employee is an employee who has worked at the plant at least one (1) month and has been trained in the appearance and characteristics of normal visible emissions

for that specific process.

- (e) The Compliance Response Plan for this unit shall contain troubleshooting contingency and response steps for when an abnormal emission is observed.

Record Keeping and Reporting Requirements [326 IAC 2-7-5(3)] [326 IAC 2-7-19]

D.4.9 Record Keeping Requirements

- (a) To document compliance with Conditions D.4.1, D.4.2, D.4.3, and D.4.5 the Permittee shall maintain records in accordance with (1) through (6) below.
 - (1) Calendar dates covered in the compliance determination period;
 - (2) Actual fuel oil usage since last compliance determination period and equivalent sulfur dioxide emissions;
 - (3) A certification, signed by the owner or operator, that the records of the fuel supplier certifications represent all of the fuel combusted during the period; and

If the fuel supplier certification is used to demonstrate compliance the following, as a minimum, shall be maintained:

- (4) Fuel supplier certifications;
- (5) The name of the fuel supplier; and
- (6) A statement from the fuel supplier that certifies the sulfur content of the fuel oil.

The Permittee shall retain records of all recording/monitoring data and support information for a period of five (5) years, or longer if specified elsewhere in this permit, from the date of the monitoring sample, measurement, or report. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit.

- (b) To document compliance with Condition D.4.8, the Permittee shall maintain records of daily visible emission notations of the boiler stacks exhaust.
- (c) All records shall be maintained in accordance with Section C - General Record Keeping Requirements, of this permit.

D.4.10 Reporting Requirements

- (a) A summary of the information to document compliance with Conditions D.4.1, D.4.2, D.4.3., and D.4.8 shall be made available upon request to IDEM, OAQ and VCAPC.
- (b) A quarterly summary of the information to document compliance with Conditions D.4.5 shall be submitted to the addresses listed in Section C - General Reporting Requirements, of this permit, using the reporting forms located at the end of this permit, or their equivalent, within thirty (30) days after the end of the quarter being reported. The report submitted by the Permittee does not require the certification by the "responsible official" as defined by 326 IAC 2-7-1(34).

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SECTION A

SOURCE SUMMARY

This permit is based on information requested by the Indiana Department of Environmental Management (IDEM), Office of Air Management (OAM) and Vigo County Air Pollution Control (VCAPC). The information describing the source contained in conditions A.1 through A.3 is descriptive information and does not constitute enforceable conditions. However, the Permittee should be aware that a physical change or a change in the method of operation that may render this descriptive information obsolete or

inaccurate may trigger requirements for the Permittee to obtain additional permits or seek modification of this permit pursuant to 326 IAC 2, or change other applicable requirements presented in the permit application.

A.1 General Information [326 IAC 2-7-4(c)] [326 IAC 2-7-5(15)]

The Permittee owns and operates a stationary maximum security correctional institution and a minimum security farm camp.

Responsible Official: Danny Nitchals
Source Address: 4200 Bureau Road North, Terre Haute, Indiana 47808
Mailing Address: Same as above
SIC Code: 9223
County Location: Vigo
County Status: Attainment for all criteria pollutants
Source Status: Part 70 Permit Program
Major PSD Rules

A.2 Emission Units and Pollution Control Equipment Summary [326 IAC 2-7-4(c)(3)]
[326 IAC 2-7-5(15)]

This stationary source consists of the following emission units and pollution control devices:

- (a) Two (2) natural gas fired boilers, identified as Seg. Boiler #5 and Seg. Boiler #6, with a maximum capacity of 2.52 million (MM) Btu per hour heat input each, and exhausting to one (1) stack, stack ID: Seg. Stack.
- (b) Three (3) natural gas fired boilers with fuel oil #2 as backup, identified as boilers #1, #2, and #3, with a maximum capacity of 62.5 million (MM) Btu per hour heat input each, and exhausting to three (3) stacks, stack ID's: Powerhouse stack #1, Powerhouses stack #2, and Powerhouse stack #3.
- (c) One (1), one color silk screen flexographic printing press, maximum printing width: 12 inches, and maximum line speed: 7.5 feet per minute.
- (d) One (1) Surface Coating Booth located at the National Bus Center, Capacity: one (1) automobile per twenty-four hour period, one (1) bus per forty-eight hour period, or fifteen (15) metal bars per hour. Method of application: automobile - HVLP, bus - HVLP, and metal bars - electrostatic, stack ID: Bus Center Surface Coating Booth stack, stack height: 37 feet, diameter: 3.5 feet, gas flow rate: 28,800 acfm, gas discharge temperature: unknown.
- (e) Four (4) natural gas fired boilers, using No. 2 fuel oil for backup, identified as: B-UP-1 with a maximum heat input rate of 42 million (MM) Btu per hour, B-UP-2 with a maximum heat input rate of 42 million (MM) Btu per hour, B-UP-3 with a maximum heat input rate of 42 million (MM) Btu per hour, and B-UP-4 with a maximum heat input rate of 42 million (MM) Btu per hour. Emissions exhausting to the following stacks: 11, 12, 13, and 14, respectively.
- (f) Four (4) No. 2 fuel fired emergency generators, identified as: EG-1 with a maximum heat input rate of 11.55 million (MM) Btu per hour, EG-2 with a maximum heat input rate of 11.55 million (MM) Btu per hour, EG-3 with a maximum heat input rate of 11.55 million (MM) Btu per hour, and EG-4 with a maximum heat input rate of 11.55 million (MM) Btu per hour. Emissions exhausting to the following stacks: 15, 16, 17, and 18, respectively.

A.3 Specifically Regulated Insignificant Activities [326 IAC 2-7-1(21)] [326 IAC 2-7-4(c)]
[326 IAC 2-7-5(15)]

This stationary source does not currently have any insignificant activities, as defined in 326 IAC 2-7-1(21) that have applicable requirements.

A.4 Part 70 Permit Applicability [326 IAC 2-7-2]

This stationary source is required to have a Part 70 permit by 326 IAC 2-7-2 (Applicability)

because:

- (a) It is a major source, as defined in 326 IAC 2-7-1(22);
- (b) It is a source in a source category designated by the United States Environmental Protection Agency (U.S. EPA) under 40 CFR 70.3 (Part 70 - Applicability).

**COMPLIANCE DATA SECTION
and
VIGO COUNTY AIR POLLUTION CONTROL**

Part 70 Quarterly Report

Source Name: United States penitentiary
Source Address: 4200 Bureau Road North, Terre Haute, Indiana 47808
Mailing Address: Same as Source Address
Part 70 Permit No.: T167-6106-00019
Source Modification No.: 167-16927-00019
Facility: Four (4) Hurst Boilers and Four (4) Emergency Generators, combined.
Fuel Oil Limit: 927 thousand gallons (kgal) per twelve (12) consecutive month period.

YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	Gallons of #2 Fuel Oil This Month	Gallons of #2 Fuel Oil Previous 11 Months	Gallons of #2 Fuel Oil 12 Month Total
Month 1			
Month 2			
Month 3			

9 No deviation occurred in this quarter.

9 Deviation/s occurred in this quarter.
Deviation has been reported on: _____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

United States Penitentiary
Terre Haute, Indiana

First Significant Permit Modification
SPM No. 167-1692-00019

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OP No. T167-6106-
00019

Permit Reviewer: Darren Woodward

**and
VIGO COUNTY AIR POLLUTION CONTROL**

Part 70 Quarterly Report

Source Name: United States penitentiary
Source Address: 4200 Bureau Road North, Terre Haute, Indiana 47808
Mailing Address: Same as Source Address
Part 70 Permit No.: T167-6106-00019
Source Modification No.: 167-16927-00019
Facility: Four (4) Hurst Boilers
Natural Gas limit: 747 million (MM) cubic feet per twelve (12) consecutive month period.

YEAR: _____

Month	Column 1	Column 2	Column 1 + Column 2
	Cubic Feet of Natural Gas This Month	Cubic Feet of Natural Gas Previous 11 Months	Cubic Feet of Natural Gas 12 Month Total
Month 1			
Month 2			
Month 3			

9 No deviation occurred in this quarter.

9 Deviation/s occurred in this quarter.
Deviation has been reported on: _____

Submitted by: _____
Title / Position: _____
Signature: _____
Date: _____
Phone: _____

**PART 70 OPERATING PERMIT
OFFICE OF AIR QUALITY
and
VIGO COUNTY AIR POLLUTION CONTROL**

**United States Penitentiary
4200 Bureau Road North
Terre Haute, Indiana 47808**

and

**Unicor Federal Prison Industry
4200 Bureau Road North
Terre Haute, Indiana 47808**

(herein known as the Permittee) is hereby authorized to operate subject to the conditions contained herein, the source described in Section A (Source Summary) of this permit.

This permit is issued in accordance with 326 IAC 2 and 40 CFR Part 70 Appendix A and contains the conditions and provisions specified in 326 IAC 2-7 as required by 42 U.S.C. 7401, et. seq. (Clean Air Act as amended by the 1990 Clean Air Act Amendments), 40 CFR Part 70.6, IC 13-15 and IC 13-17.

Operation Permit No.: T167-6106-00019	
Issued by: Janet G. McCabe, Assistant Commissioner Office of Air Management	Issuance Date: June 17, 1999
First Administrative Amendment, 167-12378 issued on September 26, 2000 (Page Affected: Page 31)	
Second Administrative Amendment, 167-14559 issued on July 19, 2001 (Page Affected: Page 5)	
Significant Source Modification No.: 167-15710 Significant Permit Modification No.: 167-16927	
Page(s) Affected: 2, 3, 4, 5, 6, 34, 35, 36, and 40	
Issued by: Original Signed by George M. Needham, Director Vigo County Air Pollution Control	Issuance Date: July 21, 2003

**Indiana Department of Environmental Management
Office of Air Quality
and
Vigo County Air Pollution Control**

**Technical Support Document (TSD) for a Significant Source Modification
and Significant Permit Modification to a Part 70 Operating Permit**

Source Background and Description

Source Name:	United States Penitentiary and Unicor Federal Prison Industry
Source Location:	4200 Bureau Road North, Terre Haute, Indiana 47808
County:	Vigo
SIC Code:	9223
Operation Permit No.:	T167-6106-00019
Operation Permit Issuance Date:	July 19, 2001
Significant Source Modification No.:	167-15710-00019
Significant Permit Modification No.:	167-16927-00019
Permit Reviewer:	Darren Woodward

Vigo County Air Pollution Control (VCAPC) has reviewed a modification application from the United States Penitentiary and Unicor Federal Prison Industry relating to the operation of a maximum security prison.

- (a) Four (4) natural gas fired boilers, using No. 2 fuel oil for backup, identified as: B-UP-1 with a maximum heat input rate of 42 million (MM) Btu per hour, B-UP-2 with a maximum heat input rate of 42 million (MM) Btu per hour, B-UP-3 with a maximum heat input rate of 42 million (MM) Btu per hour, and B-UP-4 with a maximum heat input rate of 42 million (MM) Btu per hour. Emissions exhausting to the following stacks: 11, 12, 13, and 14, respectively.
- (b) Four (4) No. 2 fuel fired emergency generators, identified as: EG-1 with a maximum heat input rate of 11.55 million (MM) Btu per hour, EG-2 with a maximum heat input rate of 11.55 million (MM) Btu per hour, EG-3 with a maximum heat input rate of 11.55 million (MM) Btu per hour, and EG-4 with a maximum heat input rate of 11.55 million (MM) Btu per hour. Emissions exhausting to the following stacks: 15, 16, 17, and 18, respectively.

Source Definition

This maximum security prison consists of a source with an on-site contractor:

- (a) United States Penitentiary, the primary operation, is located at, 4200 Bureau Road North, Terre Haute, Indiana; and
- (b) Unicor Federal Prison Industry, the supporting operation, is located at 4200 Bureau Road North, Terre Haute, Indiana.

IDEM and VCAPC has determined the United States Penitentiary and Unicor Federal Prison Industry are under the common control of United States Penitentiary. These two operations are

considered one source due to contractual control. Therefore, the term "source" in the Part 70 documents and this Significant Source Modification refers to both, the United States Penitentiary and the Unicor Federal Prison Industry, as one source.

Existing Approvals

The source was issued a Part 70 Operating Permit (T167-6106-00019) on July 19, 2001.

Enforcement Issue

There are no enforcement actions pending.

Stack Summary

Stack ID	Operation	Height (feet)	Diameter (feet)	Flow Rate (acfm)	Temperature (°F)
11	Boiler (B-UP-1)	32	2.5	13,908	422
12	Boiler (B-UP-2)	32	2.5	13,908	422
13	Boiler (B-UP-3)	32	2.5	13,908	422
14	Boiler (B-UP-4)	32	2.5	13,908	422
15	Emergency Generator (EG-1)	20	1.0	10,806	1,007
16	Emergency Generator (EG-2)	20	1.0	10,806	1,007
17	Emergency Generator (EG-3)	20	1.0	10,806	1,007
18	Emergency Generator (EG-4)	20	1.0	10,806	1,007

Recommendation

The staff recommends to the Commissioner that the Significant Source Modification be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on June 6, 2002, additional information was received on July 16, July 22, and September 3, 2002.

Emission Calculations

See Appendix A of this document for detailed emissions calculations (pages 1 through 12).

Potential To Emit

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as "the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA."

Pollutant	Potential To Emit (tons/year)
PM	10.7
PM-10	10.7

SO ₂	379
VOC	1.82
CO	62.2
NO _x	107

Note: For the purpose of determining Title V applicability for particulates, PM-10, not PM, is the regulated pollutant in consideration.

HAP's	Potential To Emit (tons/year)
Benzene	0.002
Dichlorobenzene	0.001
Formaldehyde	0.055
Hexane	1.325
Toluene	0.003
Lead	0.007
Cadmium	0.002
Chromium	0.002
Manganese	0.004
Nickel	0.002
Arsenic	0.003
Beryllium	0.002
Mercury	0.002
Selenium	0.011
TOTAL	1.42

Justification for Modification

The Part 70 Operating permit is being modified through this Part 70 Significant Source Modification. This modification is being performed pursuant to 326 IAC 2-7-10.5(f)(4) which covers modifications with a potential to emit greater than or equal to twenty-five (25) tons per year of any of the following pollutants:

- (A) Particulate matter (PM) or (PM10).
- (B) Sulfur dioxide (SO₂).
- (C) Nitrogen oxides (NO_x).
- (D) Volatile organic compounds (VOC).
- (E) Hydrogen sulfide (H₂S).
- (F) Total reduced sulfur (TRS).
- (G) Reduced sulfur compounds.
- (H) Fluorides.

Actual Emissions

The following table shows the actual emissions from the source. This information reflects the 2001 OAQ emission data.

Pollutant	Actual Emissions (tons/year)
PM	0.525
PM-10	0.347
SO ₂	0.067
VOC	3.12
CO	1.01
NO _x	11.4
HAP (specify)	0.00

Limited Potential to Emit

The table below summarizes the total potential to emit, reflecting all limits, of the significant emission units.

	Limited Potential to Emit (tons/year)						
Process/facility	PM	PM-10	SO ₂	VOC	CO	NO _x	HAPs
four boilers and four emergency generators	1.12	1.84	39.8	0.190	2.80	11.2	0.0012/0.004
Emission Threshold	25	15	40	40	100	40	10 (single) 25 (combination)

The fuel oil usage for the four (4) Hurst Boilers and the four (4) Caterpillar Emergency Generators combined shall not exceed 927 thousand gallons (kgal) per twelve (12) consecutive month period based on a maximum allowable sulfur content of 0.5% and a heat content of 140,000 Btu per gallon of no. 2 fuel oil. This limitation is equivalent to a potential to emit of less than 40 tons of SO₂ per year. Compliance with this limit makes 326 IAC 2-2 (Prevention of Significant Deterioration) not applicable.

County Attainment Status

The source is located in Vigo County.

Pollutant	Status
PM-10	attainment
SO ₂	attainment
NO ₂	attainment
Ozone	attainment
CO	attainment
Lead	attainment

- (a) Volatile organic compounds (VOC) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Vigo County has been designated as attainment or unclassifiable for ozone. Therefore, VOC emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2.

Federal Rule Applicability

- (a) The four (4) Hurst Boilers (B-UP-1, B-UP-2, B-UP-3, and B-UP-4) are subject to the New Source Performance Standard, 326 IAC 12, (40 CFR 60.40c, Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units).

Pursuant to 40 CFR 60.42c(d) (Standard for sulfur dioxide)

No owner or operator of an affected facility that combusts oil shall cause to be discharged into the atmosphere from that affected facility any gases that contain SO₂ in excess of 215 ng/J (0.50 lb/million BTU) heat input; or, as an alternative, no owner or operator of an affected facility that combusts oil in the affected facility that contains greater than 0.5 weight percent sulfur. The percent reduction requirements are not applicable to affected facilities under this paragraph.

Pursuant to 40 CFR 60.42c(h) (Standard for sulfur dioxide)

For affected facilities firing distillate oil and having heat input capacities between 10 and 100 million BTU per hour, compliance with the emission limits or fuel oil sulfur limits under this section may be determined based on a certification from the fuel supplier as described under 40 CFR 60.48c(f)(1).

Pursuant to 40 CFR 60.42c(i) (Standard for sulfur dioxide)

The SO₂ emission limits, fuel oil sulfur limits, and percent reduction requirements under this section apply at all times, including periods of startup, shutdown, and malfunction.

Pursuant to 40 CFR 60.44c(b) (Compliance and performance test methods and procedures for sulfur dioxide)

The first day of the initial performance test shall be scheduled within 30 days after the facility achieves the maximum production rate, but not more than 180 days after initial startup.

Pursuant to 40 CFR 60.44c(h) (Compliance and performance test methods and procedures for sulfur dioxide)

For affected facilities subject to 40 CFR 60.42c(h)(1) where the owner or operator seeks to demonstrate compliance with the SO₂ standards based on fuel supplier certification, the performance test shall consist of the certification, the certification from the fuel supplier, as described under 40 CFR 60.48c(f)(1).

Pursuant to 40 CFR 60.46c(e) (Emission monitoring for sulfur dioxide)

The monitoring requirements of paragraphs (a) and (d) of this section do not apply to affected facilities subject to 40 CFR 60.42c(h)(1) where the owner or operator of the affected facility seeks to demonstrate compliance with the SO₂ standards based on fuel supplier certification, as described under 40 CFR 60.48c(f)(1).

Pursuant to 40 CFR 60.48c(a) (Reporting and recordkeeping requirements)

The owner or operator of each affected facility shall submit notification of the date of construction or reconstruction, anticipated startup, and actual startup, as provided by 40 CFR 60.7. This notification shall include:

- (A) The design heat input capacity of the affected facility and identification of fuels to be combusted in the affected facility.

- (B) If applicable, a copy of any Federally enforceable requirement that limits the annual capacity factor for any fuel or mixture of fuels under 40 CFR 60.42c or 40 CFR 60.43c.
- (C) The annual capacity factor at which the owner or operator anticipates operating the affected facility based on all fuels fired and based on each individual fuel fired.
- (D) Notification if an emerging technology will be used for controlling SO₂ emissions. The Administrator will examine the description of the control device and determine whether the technology qualifies as an emerging technology. In making this determination, the Administrator may require the owner or operator of the affected facility to submit additional information concerning the control device. The affected facility is subject to the provisions of 40 CFR 60.42c(a) or (b)(1), unless and until this determination is made by the Administrator.

Pursuant to 40 CFR 60.48c(b) (Reporting and recordkeeping requirements)

The owner or operator of each affected facility subject to the SO₂ emission limits of 40 CFR 60.42c, or the PM or opacity limits of 40 CFR 60.43c, shall submit to the Administrator the performance test data from the initial and any subsequent performance tests and, if applicable, the performance evaluation of the CEMS using the applicable performance specifications in Appendix B.

Pursuant to 40 CFR 60.48c(d) (Reporting and recordkeeping requirements)

The owner or operator of each affected facility subject to the SO₂ emission limits, fuel oil sulfur limits, or percent reduction requirements under 40 CFR 60.42c shall submit quarterly reports to the Administrator. The initial quarterly report shall be postmarked by the 30th day of the third month following the completion of the initial performance test. Each subsequent quarterly report shall be postmarked by the 30th day following the end of the reporting period.

Pursuant to 40 CFR 60.48c(e) (Reporting and recordkeeping requirements)

The owner or operator of each affected facility subject to the SO₂ emission limits, fuel oil sulfur limits, or percent reduction requirements under 40 CFR 60.43c shall keep records and submit quarterly reports as required above, including the following information:

- (A) Calendar dates covered in the reporting period.
- (B) Each 30-day average SO₂ emission rate (ng/J or lb/million BTU), or 30-day average sulfur content (weight percent), calculated during the reporting period, ending with the last 30-day period in the quarter; reasons for any noncompliance with the emission standards; and a description of corrective actions taken.
- (C) If fuel supplier certification is used to demonstrate compliance, records of fuel supplier certification as described under paragraph (f)(1) of this section, as applicable. In addition to records of fuel supplier certifications, the quarterly report shall include a certified statement signed by the owner or operator of the affected facility that the records of fuel supplier certifications submitted represent all of the fuel combusted during the quarter.

Pursuant to 40 CFR 60.48c(f) (Reporting and record keeping requirements)

Fuel supplier certification shall include the following information: (for distillate oil)

1. The name of the oil supplier; and
2. A statement from the oil supplier that the oil complies with the specifications under the definition of distillate oil in 40 CFR 60.41c.

Pursuant to 40 CFR 60.48c(g) (Reporting and recordkeeping requirements)

The owner or operator of each affected facility shall record and maintain records of the amounts of each fuel combusted each day. EPA Policy may allow for this information to be kept on a monthly basis.

Pursuant to 40 CFR 60.48c(i) (Reporting and recordkeeping requirements)

All records required under this section shall be maintained by the owner or operator of the affected facility for a period of two years following the date of such record.

- (b) There are no National Emission Standards for Hazardous Air Pollutants (NESHAPs)(326 IAC 14 and 40 CFR Part 63) applicable to this source.

State Rule Applicability - Entire Source

326 IAC 2-2 (PSD Minor Limit)

The oil usage for the four (4) Hurst Boilers and the four (4) Caterpillar Emergency Generators combined shall not exceed 927 thousand gallons (kgal) per twelve (12) consecutive month period based on a maximum allowable sulfur content of 0.5% and a heat content of 140,000 Btu per gallon of no. 2 fuel oil. This limitation is equivalent to a potential to emit of less than 40 tons of SO₂ per year. Compliance with this limit makes 326 IAC 2-2 (Prevention of Significant Deterioration) not applicable.

326 IAC 5-1 (Opacity Limitations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following, unless otherwise stated in this permit:

- (a) Opacity shall not exceed an average of forty percent (40%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor in a six (6) hour period.

326 IAC 1-6-3 (Preventive Maintenance Plan)

The source submitted a Preventive Maintenance Plan (PMP) in January of 2000. This PMP has been verified to fulfill the requirements of 326 IAC 1-6-3 (Preventive Maintenance Plan).

326 IAC 1-5-2 (Emergency Reduction Plans)

The source submitted an Emergency Reduction Plan (ERP) in January of 2000. The ERP was updated in January of 2001 due to a change of the Responsible Official. The ERP has been verified to fulfill the requirements of 326 IAC 1-5-2 (Emergency Reduction Plans).

State Rule Applicability - Individual Facilities

326 IAC 6-1-2 (Particulate Limitations)

Pursuant to 326 IAC 6-1-2(a), general particulate matter emitting units shall not discharge to the atmosphere gases which contain in excess of 0.03 grain per dry standard cubic foot of particulate matter.

Pursuant to 326 IAC 6-1-2(b)(2), particulate matter emissions shall not exceed 0.15 pounds per million BTU for all liquid fuel fired steam generators.

326 IAC 6-2-4 (Particulate emission limitations for sources of indirect heating)

Pursuant to 326 IAC 6-2-4 (Particulate emission limitations for sources of indirect heating) the

particulate emissions from indirect heating facilities constructed after September 21, 1983 (Boilers #1, #2, #3, #5, #6, B-UP-1, B-UP-2, B-UP-3, and B-UP-4) shall be limited to 0.236 pounds per million (MM) Btu heat input.

This limitation is based on the following equation: $Pt = 1.09/Q^{0.26}$, where Pt = pounds of particulate matter emitted per million Btu (lb/MMBtu/hr) heat input. Q = total source maximum operating capacity rating in million Btu per hour (MMBtu/hr) heat input.

326 IAC 7-1.1-2 (Sulfur Dioxide emission limits)

Pursuant to 326 IAC 7-1.1-2, all combustion units which have the potential to emit either 25 tons per year or 10 pounds per hour of Sulfur Dioxide must comply with either this provision or any unit specific limitations in 326 IAC 7-4-3 (for Vigo County). Boilers B-UP-1, B-UP-2, B-UP-3, and B-UP-4 shall comply with the specific limitation (while firing distillate oil) of 0.5 pounds of SO₂ per million BTU.

Conclusion

The operation of the four (4) boilers and four (4) emergency generators shall be subject to the conditions of the attached proposed SSM No. 167-15710-00019.

Appendix A: Emissions Calculations
Commercial/Institutional/Residential Combustors (< 100 mmBtu/hr)
Emergency generators using #2 Fuel Oil

Company Name: United States Penitentiary
Address, City IN Zip: 4200 Bureau Road North, Terre Haute, IN 47808
SSM No.: 167-15710
SPM No.: 167-16927
Pit ID: 167-00019
Reviewer: Darren Woodward
Date: December 12, 2002

Heat Input Capacity
MMBtu/hr

Potential Throughput
kgals/year

S = Weight % Sulfur

0.5

11.55

41.25

Emission Factor in lb/kgal	Pollutant					
	PM*	PM10	SO2	NOx	VOC	CO
	2.0	3.3	71 (142.0S)	20.0	0.34	5.0
Potential Emission in tons/yr	0.041	0.068	1.5	0.41	0.007	0.10
Total for 4 emergency generators	0.165	0.272	5.86	1.65	0.028	0.413

1 gallon of No. 2 Fuel Oil has a heating value of 140,000 Btu

Emergency Generators = 500 hours per year.

Potential Throughput (kgals/year) = Heat Input Capacity (MMBtu/hr) x 500 hrs/yr x 1kgal per 1000 gallon x 1 gal per 0.140 MM Btu

Emission Factors are from AP 42, Tables 1.3-1, 1.3-2, and 1.3-3 (SCC 1-03-005-01/02/03) Supplement E 9/98 (see erata file)

*PM emission factor is filterable PM only. Condensable PM emission factor is 1.3 lb/kgal.

Emission (tons/yr) = Throughput (kgals/ yr) x Emission Factor (lb/kgal)/2,000 lb/ton

Appendix A: Emissions Calculations
Boilers using Natural Gas Combustion Only
MM BTU/HR <100

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Small Industrial Boiler

Company Name: United States Penitentiary
Address City IN Zip: 4200 Bureau Road North, Terre Haute, IN 47808
SSM No.: 167-15710
SPM No.: 167-16927
Plt ID: 167-00019
Reviewer: Darren Woodward
Date: December 12, 2002

Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

42.0

367.9

Pollutant						
Emission Factor in lb/MMCF	PM* 1.9	PM10* 7.6	SO2 0.6	NOx 100.0 **see below	VOC 5.5	CO 84.0
Potential Emission in tons/yr	0.350	1.40	0.110	18.4	1.01	15.5
Total for 4 boilers (tons/yr)	1.40	5.59	0.442	73.6	4.05	61.8

*PM emission factor is filterable PM only. PM10 emission factor is condensable and filterable PM10 combined.

**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

Methodology

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03 (SUPPLEMENT D 3/98)

Emission (tons/yr) = Throughput (MMCF/yr) x Emission Factor (lb/MMCF)/2,000 lb/ton

Appendix A: Emissions Calculations
Commercial/Institutional/Residential Combustors (< 100 mmBtu/hr)
Boilers using #2 Fuel Oil

Company Name: United States Penitentiary
Address, City IN Zip: 4200 Bureau Road North, Terre Haute, IN 47808
SSM No.: 167-15710
SPM No.: 167-16927
Plt ID: 167-00019
Reviewer: Darren Woodward
Date: December 12, 2002

Heat Input Capacity
MMBtu/hr

Potential Throughput
kgals/year

S = Weight % Sulfur

0.5

42

2628

Emission Factor in lb/kgal	Pollutant					
	PM*	PM10	SO2	NOx	VOC	CO
	2.0	3.3	71 (142.0S)	20.0	0.34	5.0
Potential Emission in tons/yr	2.63	4.34	93.3	26.3	0.447	6.57
Total for 4 boilers (tons/yr)	10.5	17.3	373	105	1.79	26.3

Methodology

1 gallon of No. 2 Fuel Oil has a heating value of 140,000 Btu

Potential Throughput (kgals/year) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1kgal per 1000 gallon x 1 gal per 0.140 MM Btu

Emission Factors are from AP 42, Tables 1.3-1, 1.3-2, and 1.3-3 (SCC 1-03-005-01/02/03) Supplement E 9/98 (see erata file)

*PM emission factor is filterable PM only. Condensable PM emission factor is 1.3 lb/kgal.

Emission (tons/yr) = Throughput (kgals/ yr) x Emission Factor (lb/kgal)/2,000 lb/ton

Appendix A: Emissions Calculations
Commercial/Institutional/Residential Combustors (< 100 mmBtu/hr)
Boilers using #2 Fuel Oil

Company Name: United States Penitentiary
Address, City IN Zip: 4200 Bureau Road North, Terre Haute, IN 47808
SSM No.: 167-15710
SPM No.: 167-16927
Plt ID: 167-00019
Reviewer: Darren Woodward
Date: December 12, 2002

HAPs - Metals

Emission Factor in lb/mmBtu	Arsenic 4.0E-06	Beryllium 3.0E-06	Cadmium 3.0E-06	Chromium 3.0E-06	Lead 9.0E-06
Potential Emission in tons/yr	7.36E-04	5.52E-04	5.52E-04	5.52E-04	1.66E-03
Potential Emissions for 4 boilers	2.94E-03	2.21E-03	2.21E-03	2.21E-03	6.62E-03

HAPs - Metals (continued)

Emission Factor in lb/mmBtu	Mercury 3.0E-06	Manganese 6.0E-06	Nickel 3.0E-06	Selenium 1.5E-05
Potential Emission in tons/yr	5.52E-04	1.10E-03	5.52E-04	2.76E-03
Potential Emissions for 4 boilers	2.21E-03	4.42E-03	2.21E-03	1.10E-02

Methodology

No data was available in AP-42 for organic HAPs.

Potential Emissions (tons/year) = Throughput (mmBtu/hr)*Emission Factor (lb/mmBtu)*8,760 hrs/yr / 2,000 lb/ton

Appendix A: Emissions Calculations
Boilers using Natural Gas Combustion Only
MM BTU/HR <100

Page 5 of 12 TSD App A

Small Industrial Boiler

Company Name: United States Penitentiary
Address City IN Zip: 4200 Bureau Road North, Terre Haute, IN 47808
SSM No.: 167-15710
SPM No.: 167-16927
Plt ID: 167-00019
Reviewer: Darren Woodward
Date: December 12, 2002

HAPs - Organics

Emission Factor in lb/MMcf	Benzene 2.1E-03	Dichlorobenzene 1.2E-03	Formaldehyde 7.5E-02	Hexane 1.8E+00	Toluene 3.4E-03
Potential Emission in tons/yr	3.863E-04	2.208E-04	1.380E-02	3.311E-01	6.255E-04
Potential Emission for 4 boilers	1.55E-03	8.83E-04	5.52E-02	1.32E+00	2.50E-03

HAPs - Metals

Emission Factor in lb/MMcf	Lead 5.0E-04	Cadmium 1.1E-03	Chromium 1.4E-03	Manganese 3.8E-04	Nickel 2.1E-03
Potential Emission in tons/yr	9.198E-05	2.024E-04	2.575E-04	6.990E-05	3.863E-04
Potential Emission for 4 boilers	3.68E-04	8.09E-04	1.03E-03	2.80E-04	1.55E-03

Methodology is the same as page 1.

The five highest organic and metal HAPs emission factors are provided above.
 Additional HAPs emission factors are available in AP-42, Chapter 1.4.

Calculation Summary

Source Name:	United States Penitentiary and Unicor Federal
	Prison Industry
Source Location:	4200 Bureau Road North, Terre Haute, Indiana 47808
County:	Vigo
SIC Code:	9223
Operation Permit No.:	T167-6106-00019
Operation Permit Issuance Date:	July 19, 2001
Significant Source Modification No.:	167-15710-00019
Significant Permit Modification No.:	167-16927-00019
Permit Reviewer:	Darren Woodward

	PM (Tons/yr)	PM10 (Tons/yr)	SO2 (Tons/yr)	NOx (Tons/yr)	VOC (Tons/yr)	CO (Tons/yr)
Boilers (nat. gas, 4 boilers)	1.40	5.59	0.441	73.6	4.05	61.8
Boilers (No. 2, 4 boilers)	10.5	17.3	373	105	1.79	26.3
Emergency generators, 500 hours (No. 2, 4 generators)	0.165	0.272	5.86	1.65	0.028	0.413
Worst Case	10.7	17.6	379	107	1.82	62.2

HAP	HAP Emissions (TPY) Natural Gas	HAP Emissions (TPY) Fuel Oil	Worst Case HAP Emissions (TPY)
Benzene	0.002		0.002
Dichlorobenzene	0.001		0.001
Formaldehyde	0.055		0.055
Hexane	1.325		1.325
Toluene	0.003		0.003
Lead	0.000	0.007	0.007
Cadmium	0.001	0.002	0.002
Chromium	0.000	0.002	0.002
Manganese	0.002	0.004	0.004
Nickel		0.002	0.002
Arsenic		0.003	0.003
Beryllium		0.002	0.002
Mercury		0.002	0.002
Selenium		0.011	0.011
Total HAPs	1.39	0.035	1.42

Calculation Summary

Source Name:	United States Penitentiary and Unicor Federal
	Prison Industry
Source Location:	4200 Bureau Road North, Terre Haute, Indiana 47808
County:	Vigo
SIC Code:	9223
Operation Permit No.:	T167-6106-00019
Operation Permit Issuance Date:	July 19, 2001
Significant Source Modification No.:	167-15710-00019
Significant Permit Modification No.:	167-16927-00019
Permit Reviewer:	Darren Woodward

Calculations based on a limit of 927,000 gallons of fuel oil:

	PM (Tons/yr)	PM10 (Tons/yr)	SO2 (Tons/yr)	NOx (Tons/yr)	VOC (Tons/yr)	CO (Tons/yr)
PTE based on limit of 927,000 gallons of fuel oil	1.12	1.84	39.8	11.2	0.190	2.80

HAP	HAP Emissions (TPY) Fuel Oil	HAP Emissions (TPY) with limit of 927,000 gallons of fuel oil
Lead	0.007	0.0007
Cadmium	0.002	0.0002
Chromium	0.002	0.0002
Manganese	0.004	0.0004
Nickel	0.002	0.0002
Arsenic	0.003	0.0003
Beryllium	0.002	0.0002
Mercury	0.002	0.0002
Selenium	0.011	0.0012
Total HAPs	0.035	0.004

Appendix A: Emissions Calculations
Commercial/Institutional/Residential Combustors (< 100 mmBtu/hr)
Limiting Potential Throughput (kgals/year)
Boilers using #2 Fuel Oil

Company Name: United States Penitentiary
Address, City IN Zip: 4200 Bureau Road North, Terre Haute, IN 47808
SSM No.: 167-15710
SPM No.: 167-16927
Plt ID: 167-00019
Reviewer: Darren Woodward
Date: January 27, 2003

Heat Input Capacity
MMBtu/hr

Limited Potential Throughput
kgals/year

S = Weight % Sulfur

0.5

42

927

Emission Factor in lb/kgal	Pollutant					
	PM* 2.0	PM10 3.3	SO2 71 (142.0S)	NOx 20.0	VOC 0.34	CO 5.0
Potential Emission for each boiler	0.232	0.382	8.23	2.32	0.039	0.579
Potential Emission for 4 boilers (tons/y)	0.927	1.53	32.9	9.27	0.158	2.32

Methodology

1 gallon of No. 2 Fuel Oil has a heating value of 140,000 Btu

Potential Emissions for 4 boilers (ton/y)

Emission Factors are from AP 42, Tables 1.3-1, 1.3-2, and 1.3-3 (SCC 1-03-005-01/02/03) Supplement E 9/98 (see erata file)

*PM emission factor is filterable PM only. Condensable PM emission factor is 1.3 lb/kgal.

Appendix A: Emissions Calculations
Natural Gas Combustion Only
MM BTU/HR <100
Small Industrial Boiler
Limiting Potential Throughput (MMCF/yr)

Company Name: United States Penitentiary
Address City IN Zip: 4200 Bureau Road North, Terre Haute, IN 47808
CP: 167-15710
Plt ID: 167-00019
Reviewer: Darren Woodward
Date: January 27, 2003

Heat Input Capacity
MMBtu/hr

Potential Throughput
MMCF/yr

42.0

747.0

Pollutant						
Emission Factor in lb/MMCF	PM*	PM10*	SO2	NOx	VOC	CO
	1.9	7.6	0.6	100.0 **see below	5.5	84.0
Potential Emission each boiler (tons/yr)	0.177	0.710	0.056	9.34	0.514	7.84
Potential Emission for 4 boilers (tons/yr)	0.710	2.84	0.224	37.4	2.05	31.4

*PM emission factor is filterable PM only. PM10 emission factor is condensable and filterable PM10 combined.

**Emission Factors for NOx: Uncontrolled = 100, Low NOx Burner = 50, Low NOx Burners/Flue gas recirculation = 32

Methodology

All emission factors are based on normal firing.

MMBtu = 1,000,000 Btu

MMCF = 1,000,000 Cubic Feet of Gas

Potential Throughput (MMCF) = Heat Input Capacity (MMBtu/hr) x 8,760 hrs/yr x 1 MMCF/1,000 MMBtu

Emission Factors are from AP 42, Chapter 1.4, Tables 1.4-1, 1.4-2, 1.4-3, SCC #1-02-006-02, 1-01-006-02, 1-03-006-02, and 1-03-006-03

Multiple Fuel Limits Calculations

Four (4) 42 MMBtu per hour boilers

Natural Gas firing (4 boilers total):

PM 1.40 tons/yr
 PM10 5.59 tons/yr
 SO₂ 0.441 tons/yr
 NO_x 73.6 tons/yr
 VOC 4.05 tons/yr
 CO 61.8 tons/yr

No. 2 oil firing (4 boilers total):

PM 10.5 tons/yr
 PM10 17.3 tons/yr
 SO₂ 373 tons/yr
 NO_x 105 tons/yr
 VOC 1.79 tons/yr
 CO 26.3 tons/yr

Four (4) 11.55 MMBtu per hour Emergency Generators

PM 0.165 tons/yr
 PM10 0.272 tons/yr
 SO₂ 5.86 tons/yr
 NO_x 1.65 tons/yr
 VOC 0.028 tons/yr
 CO 0.413 tons/yr

Fuel Limits for NO_x (using natural gas) and SO₂ (using No. 2 fuel oil).

$$\begin{aligned} \text{NO}_x &= 39 \text{ tons/yr (limit)} \\ &\quad \text{S } \underline{1.65 \text{ tons/yr (generators)}} \\ &= 37.35 \text{ tons/yr limited NO}_x \\ &\quad \text{SO}_2 \end{aligned}$$

$$\begin{aligned} \text{SO}_2 &= 39 \text{ tons/yr (limit)} \\ &\quad \text{- } \underline{5.86 \text{ tons/yr (generators)}} \\ &= 33.14 \text{ tons/yr limited} \end{aligned}$$

Potential fuel usage.

$$\begin{aligned} \text{NO}_x &= (168 \text{ MMBtu/hr})(8760 \text{ hr/yr})(1 \text{ MMCF}/1000 \text{ MMBtu}) = 1472 \text{ MMCF/yr} \\ \text{SO}_2 &= (168 \text{ MMBtu/hr})(8760 \text{ hr/yr})(1 \text{ kgal}/1000 \text{ gal})(1 \text{ gal}/0.140 \text{ MMBtu}) = 10512 \text{ kgal/yr} \end{aligned}$$

Natural gas ("NO_x") usage limit:

$$\frac{(37.35 \text{ tons/yr})(1472 \text{ MMCF/yr})}{(73.6 \text{ tons/yr})} = 747 \text{ MMCF/yr}$$

No. 2 oil ("SO₂") usage limit:

$$\frac{(33.14 \text{ tons/yr})(10512 \text{ kgal/yr})}{(373 \text{ tons/yr})} = 934 \text{ kgal/yr}$$

Limited emissions of each fuel.

"NO_x" Limit (Nat. gas limited firing)

PM 0.711 tons/yr
 PM10 2.83 tons/yr
 SO₂ 0.224 tons/yr
 NO_x 37.35 tons/yr
 VOC 2.06 tons/yr
 CO 31.7 tons/yr

"SO₂" Limit (No. 2 oil limited firing)

PM 0.933 tons/yr
 PM10 1.54 tons/yr
 SO₂ 33.14 tons/yr
 NO_x 9.33 tons/yr
 VOC 0.159 tons/yr
 CO 2.34 tons/yr

$$\begin{aligned} \text{SO}_2 &= 33.14 \text{ tons/yr} \\ &\quad - 0.224 \text{ tons/yr (limited combustion of Nat. gas)} \\ &= 32.916 \text{ tons/yr limited SO}_2 \end{aligned}$$

No. 2 oil ("SO₂") revised usage limit:

$$= \frac{(32.916 \text{ tons/yr})(10512 \text{ kgal/yr})}{(373 \text{ tons/yr})}$$

$$= 927.6 \text{ kgal/yr (total for 4 boilers, 231 kgal/yr for each boiler)}$$

NO_x Limit (Nat. gas limited firing).

PM 0.711 tons/yr
 PM10 2.83 tons/yr
 SO₂ 0.224 tons/yr
 NO_x 37.35 tons/yr
 VOC 2.06 tons/yr
 CO 31.3 tons/yr

SO₂ revised limit (No. 2 oil limited firing).

PM 0.926 tons/yr
 PM10 1.53 tons/yr
 SO₂ 32.91 tons/yr
 NO_x 9.26 tons/yr
 VOC 0.158 tons/yr
 CO 2.32 tons/yr

Equivalence of No. 2 fuel oil to Natural gas.

Nat. gas:		No. 2 fuel oil:	
=	$\frac{(73.6 \text{ tons/yr})(2000 \text{ lb/ton})}{(1472 \text{ MMCF/yr})}$	=	$\frac{(105 \text{ tons/yr})(2000 \text{ lb/ton})}{(10512 \text{ MMCF/yr})}$
=	100 lbs/MMCF	=	20 lb/1000 gals

Equivalence ratio:

$$= \frac{20 \text{ lb/1000 gals}}{100 \text{ lb/MMCF}} = \frac{0.20 \text{ MMCF}}{1000 \text{ gals}}$$

The input of No. 2 fuel oil to the 168 MMBtu per hour boilers (4 boilers at 42 MMBtu per hour each) shall be limited to 77,300 gallons per month (927.6 kgal/yr). This usage limit is equivalent to a potential to emit of 32.91 tons of sulfur dioxide per year.

The input of natural gas and natural gas equivalents to the 168 MMBtu per hour boilers shall be limited to 62.3 million cubic feet per month (747 MMCF/yr). For the purpose of determining compliance, every 1000 gallons of No. 2 fuel oil burned shall be equivalent to 0.20 million cubic feet of natural gas based on nitrogen oxides emissions. This usage limit is required to limit the potential to emit of nitrogen oxides to less than 37.35 tons per year.